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Rehabilitation after critical illness: could a ward-based generic assistant promote recovery?

Lisa Gabrielle Salisbury, Judith Lorna Merriweather, Timothy Simon Walsh

Abstract

Aims: The aim of this paper is to explore issues surrounding the implementation of a generic rehabilitation assistant (GRA) to provide ward-based rehabilitation after critical illness.

Background: Following critical illness a range of both physical and psychological problems can occur that include muscle wasting and weakness, fatigue, reduced appetite, post-traumatic stress, anxiety and depression. Limited research exists evaluating the provision of rehabilitation to this patient group. This paper explores one possible service delivery model providing ward-based rehabilitation after critical illness. The model explored is a GRA working in conjunction with ward-based staff.

Results: We describe how a GRA worked effectively with ward-based teams to provide additional rehabilitation in the period after discharge from intensive care. Benefits included greater continuity of care that was flexible to the individual needs of patients. Some aspects of the role were challenging for the GRA and highlighted the need for good communication skills. A need for comprehensive training of the GRA was demonstrated.

Conclusions: Our experience demonstrates that it is feasible to deliver ward-based rehabilitation after critical illness using the GRA service delivery model.

Relevance to clinical practice: This model of service delivery offers the potential to improve outcomes for patients after a critical illness. Further research evaluating this model of care is required before implementation into clinical practice.

Background

Critical illness results in both short and long-term physical and psychological problems which include muscle wasting and weakness, fatigue, reduced appetite, post-traumatic stress, anxiety and depression (Griffiths and Jones, 1999; Jones *et al.*, 2001; Combes *et al.*, 2003; Herridge *et al.*, 2003; Cuthbertson *et al.*, 2004; van der Schaff *et al.*, 2008). Patients report a reduction in their health related quality of life in both the short and long term (Pettila *et al.*, 2000; Combes *et al.*, 2003; Cuthbertson *et al.*, 2005). The National Institute of Clinical Excellence (NICE) recently published a clinical guideline entitled “Rehabilitation after critical illness” (NICE, 2009), which made recommendations concerning key principles of care during recovery after critical illness. The guideline recommends a structured rehabilitation programme that includes rehabilitation goals, a self-directed rehabilitation manual, liaison with primary/community care, communication of information to other healthcare settings, and a contact point after discharge from critical care and hospital. However, the majority of recommendations are based on expert opinion and further research evaluating interventions to promote recovery after critical illness is required.

Published research evaluating rehabilitation interventions following critical illness is limited. Some work has been undertaken during the intensive care stay that suggests early mobilisation is feasible and safe (Nava, 1998; Bailey *et al.*, 2007; Stiller, 2007; Morris *et al.*, 2008). Interpretation and

generalisability of these data are difficult, because definitions of 'mobilisation' vary between studies, and the work has been undertaken in sub-populations

of critically ill patients. Only one study has evaluated rehabilitation during the ward-based phase. Jones *et al.* (2003) evaluated the provision of a self-help rehabilitation manual, introduced to the patient on the ward on average one week after discharge from the intensive care unit (ICU). This was supported with follow-up visits on the ward, telephone support after discharge home, and clinic visits at 8 weeks and 6 months after ICU discharge. Results demonstrated a statistically significant improvement in SF-36 physical function scores. The SF-36 is a measure of health-related quality of life and the physical function score is a sub-score representing perceived physical function and impact on quality of life (Ware and Sherbourne, 1992; Ware *et al.*, 1995; Ware and Kosinski, 2001). The authors suggested that such a package is useful to improve physical and psychological recovery after critical illness. Measures of psychological well-being at entry to the study were provided although physical ability was not reported and this makes it difficult to ascertain whether the package is feasible for all patients after critical illness. For patients with poor physical ability compliance with a self-help manual could be difficult. Van der Schaaf *et al.* (2008) measured the functional status of 69 survivors between three and seven days after discharge from an intensive care unit. Using the Barthel Index (Mahoney and Barthel, 1965), a measure of patient dependence on nursing staff, the authors found that within the population 76% were either totally or severely dependent on nursing staff for their activities of daily living. The feasibility of using a self-help manual with such a population could be questioned. The focus of rehabilitation research after critical illness has more commonly been during the phase of recovery after hospital discharge. Moran *et al.* (2005)

investigated a nurse led telephone follow up and Cuthbertson *et al.* (in press) undertook an evaluation of follow-up clinics. Two ongoing trials are evaluating home-based physical rehabilitation (Elliott *et al.*, 2006) and aerobic exercise rehabilitation (<http://www.pixstudy.co.uk/index.php>) programmes. Further research evaluating rehabilitation after critical illness and in particular early rehabilitation is required.

The focus on research after discharge from hospital is likely to be related to the ease of evaluating rehabilitation during this phase as during the intensive care and ward-based phases many confounding issues are present that affect study design and interpretation. The acute critical illness resulting in an ICU admission will present many confounding issues while complex management issues exist during the ward-based phase. The potential benefits of targeted early rehabilitation after critical illness are uncertain and poorly understood, but it is plausible that further deterioration of existing problems could be prevented, and the development of further problems avoided (Bernhardt, 2003; Stucki *et al.*, 2005). The focus of this paper is the implementation of rehabilitation during the ward-based phase of recovery; the potential confounding issues present during this stage will be discussed in more detail.

Following a stay in intensive care patients are commonly discharged back to the care of individual specialities e.g. respiratory medicine, renal medicine, vascular surgery and to different geographical locations around the hospital. While benefiting from the clinical expertise of one clinical area e.g. respiratory medicine, there is often poor recognition or management of the ICU specific

problems (NICE, 2009). As a result, ward-based management often does not address ICU related problems or provide appropriate rehabilitation. Acute hospital wards, by nature, are designed to manage acute problems e.g. chest infections or post-operative care with the aim of quick treatment and discharge. In comparison, patients after intensive care will often present with complex rehabilitation needs and be very dependent on nursing staff (van der Schaaf *et al.*, 2008). Nursing and allied health professional staff are often limited in the care they can offer by available resources and the competing demands of more acutely unwell patients. However, this phase of recovery offers a window of opportunity to deliver rehabilitation that could be both clinically and cost-effective.

A number of different rehabilitation strategies could be considered during the ward-phase of recovery after critical illness. Many of these approaches to rehabilitation have been developed within the field of stroke rehabilitation (Kalra *et al.*, 2000; Pullenayegum *et al.*, 2005; Stroke Trialists' Collaboration, 2006) but their effectiveness for patients after critical illness is unproven. The provision of a manual with associated follow-up and clinic visits has shown benefit (Jones *et al.*, 2003), but could be limited by poor functional ability (Van der Schaaf *et al.*, 2008) and complications such as delirium. Another option is a roaming specialist team providing advice only to ward-based staff, in a similar manner to outreach teams (DoH, 2000; Priestley *et al.*, 2004), but with a rehabilitation focus as has been trialled in stroke management (Kalra *et al.*, 2000). Whilst this approach would provide support and expertise, it would not provide any additional resource to manage these patients, and a lack of ward-

based resource has been identified as a problem for patients after critical illness (Salisbury *et al.*, in press). A roaming specialist rehabilitation team providing treatment could be considered although this approach has not been reported in other patient populations and there are a number of issues require consideration. How such a team would work with already established ward-based staff is unknown as it would be difficult to delineate who had responsibility for issues such as discharge planning. Management of all patients in a post-ICU rehabilitation ward, analagous to the stroke unit model (Stroke Trialists Collaboration, 2006) is another possibility for management. This would require considerable infrastructure changes within the hospital, and is unlikely to be implemented without evidence. A further option could be the use of a generic rehabilitation assistant providing additional rehabilitation in conjunction with the established ward-based team. This model has been successfully used to provide additional weekend rehabilitation in a stroke ward (Pullenayegum *et al.*, 2005).

After consideration of the different options the use of a generic rehabilitation assistant appeared to be the most feasible option for delivering ward-based rehabilitation after critical illness in our hospital. Historically such 'assistant' posts have been used primarily in a uni-professional role by many professions including dietitians, nurses, occupational therapists and physiotherapists. They are known under many titles including healthcare assistant, support worker, rehabilitation assistant, therapy assistant and technical instructors (Chartered Society of Physiotherapy, 2006). The different titles have often reflected varying roles and responsibilities, differing between posts and

professions. In recent years, as a result of government policy and clinical need, generic worker posts have been developed (Stanmore *et al.*, 2006). The aim of these generic posts has been to provide assistance to different professions for the same patients, thus improving the continuity and quantity of care for the patient. The multiple problems that patients present with after critical illness and the different professions involved in their care suggest that a generic rehabilitation assistant would be a feasible option to provide enhanced rehabilitation after critical illness.

We designed a small randomised controlled trial to explore the feasibility of a generic rehabilitation assistant (GRA) to deliver enhanced physiotherapy and nutritional rehabilitation after critical illness. The results of this are published elsewhere (Salisbury *et al.*, in press) and the focus of this paper is the description of the role and issues raised around the implementation of such a post using a case description.

Methods

Ethical approval for this small pilot feasibility study was obtained from the Scotland A Research Ethics Committee. Patients were approached for inclusion in the study by one of the researchers (LS or JM) when discharge planning from the intensive care unit had commenced and if they had received four days or more of mechanical ventilation. Patients were excluded if;

- their underlying illness had an established rehabilitation service e.g. stroke, head injury and liver transplant
- referral to palliative care

- intravenous drug abuse
- participation in other randomised controlled trial
- pregnancy

If patients were unable to give informed consent their nearest relative/welfare guardian was approached for consent. If, and when, a participant became capacitated they were approached for their own consent. In total 16 participants were recruited to the study with eight participants randomised into the control and intervention groups. The control group continued to receive 'standard' ward care. The intervention group received 'standard' ward care plus access to enhanced rehabilitation delivered by a generic rehabilitation assistant working in conjunction with ward-based staff.

Outcome measures collected included the Rivermead Mobility Index (RMI) (Collen *et al.*, 1991), a scale measuring mobility made up of 15 yes/no questions. A minimum score of 0 represents very poor mobility while a maximum score of 15 represents a high level of mobility. The timed up and go (TUG) (Podsiadlo *et al.*, 1991) is a timed test of the ability to rise from a chair, walk three metres, turn around and sit back down. Some validity and reliability work has been carried out with both the RMI and TUG, although not in populations after critical illness. The ten metre walk test reported by Wade *et al.* (1987) is a simple, cheap and easy to use outcome measure that measures the time taken to walk ten metres. This is a widely used outcome measure although care must be taken to ensure the test set-up and instructions are standardised as this can affect the validity and reliability of the test. Visual analogue scales (VAS) are a quick and easy way of rating a

characteristic or phenomena on a horizontal line usually 10cm long (Crichton, 2001). For example, the measurement of pain can be represented as 0 equalling no pain and 10 the worse pain imaginable and the person rates their pain on the scale. Visual Analogue scales were chosen to enable a number of phenomena, common after critical illness to be measured, and in this study were used to measure breathlessness, appetite, pain, joint stiffness, confidence walking and fatigue.

Assessment of nutritional status is difficult in the early phase after critical illness as large shifts in body fluids make measurements of weight inaccurate and limited mobility can make anthropometric measures difficult to undertake. For this reason grip strength was used to provide a functional assessment of nutritional status (Griffiths and Clark, 1984). Food record charts were collected to calculate the actual percentage calorie and protein intake compared to the patients recommended requirements. It is recognised there are potential sources of bias associated with any measure of dietary intake (Nelson, 2000), but validity was increased as the food intake was documented in hospital using standardised portion sizes for which detailed nutritional analysis was available.

Outcomes were collected at baseline and three months after discharge from intensive care by a nurse blind to group allocation, the results are reported elsewhere (Salisbury *et al.* , in press). The GRA collected weekly measures to assess ongoing progress.

The case description will illustrate how the GRA was able to successfully deliver rehabilitation in conjunction with the established ward-based team, highlight some of the issues surrounding this model of service delivery and includes weekly outcomes to illustrate patient progress. All the issues, both positive and negative, will be considered in the discussion.

Case Description

A 78 year old lady was admitted to intensive care following a subtotal colectomy and stoma for ischaemic bowel. She subsequently became septic and suffered multi-organ failure and spent a total of 23 days in the intensive care unit before discharge to a surgical ward. During her intensive care stay she was ventilated for a total of 19 days, with a tracheostomy inserted on day 10 and two failed extubations during this time.

She had a past medical history of hypertension and cerebral vascular accident (CVA) resulting in a very mild right-sided weakness. Prior to hospital admission she lived at home with her husband, walked with a stick and was independent in all activities of daily living. Her husband was affected by arthritis and had concerns about how he was going to cope with his wife when she returned home.

At the time of discharge from the intensive care unit she was unable to move around the bed independently, and could not transfer or mobilise. At this time she scored zero on the Rivermead Mobility Index, indicating very poor mobility and high dependency on ward based staff. She was receiving naso-gastric

(NG) feeding and a speech and language therapy review at this time found severe oesophageal dysphagia and poor airway protection resulting in a recommendation of nil by mouth.

In this study the GRA was acting in an assistant role predominantly for physiotherapy and dietetic staff. Following assessment of the patient by the qualified ward-based staff, physiotherapy and nutritional tasks were identified by these qualified professional staff that the GRA was able to deliver. Tasks were only delegated to the GRA after adequate training. Table 1 summarises the main tasks carried out by the GRA when delivering the enhanced rehabilitation to this patient.

Insert Table 1

The tasks delegated to the GRA were identified from the problem lists and treatment plans generated by the professional ward-based staff. The physiotherapist identified the main physiotherapy problems as

1. reduced muscle strength
2. reduced bed mobility (rolling, lying to sitting and sit to lying)
3. reduced ability to undertake transfers (sit to stand, stand to sit, bed to chair)
4. reduced walking mobility
5. reduced exercise tolerance
6. fatigue

The physiotherapy tasks delegated to the GRA aimed to address the physical problems identified. The exercise programme included lower and upper limb strengthening and balance exercises, and practice of component parts of movement to facilitate bed and walking mobility and transfers. At the time of discharge from intensive care the patient was very physically debilitated and the rehabilitation of bed and walking mobility and transfers required two people using specialist equipment. The ward-based physiotherapy staff had limited resources and were unable to provide two members of staff for this rehabilitation on a regular basis however, the presence of the GRA allowed these sessions to be undertaken and facilitated early rehabilitation. Once the patient was able to do bed and walking mobility and transfers with the assistance of one person only, the GRA was able to deliver these sessions alone. As an ongoing part of these one-to-one sessions education about pacing, both to increase exercise tolerance and manage fatigue was delivered to the patient. The GRA used PhysioTools, a software programme for exercise prescription (www.physiotools.com), to print off a sheet of exercises to allow the patient to undertake independent practice of exercises, particularly at the weekend. The role also included arranging some exercise sessions in the physiotherapy gym and facilitate trips off the ward to hospital shop and canteen; her husband attended some of these.

The dietitian identified the main nutritional problems as

1. ineffective swallow resulting in dependence on enteral nutrition
2. increased nutritional requirements to facilitate weight gain
3. increased fluid losses through ileostomy

The presence of the GRA allowed any problems to be immediately reported to the ward-based dietitian to facilitate swift resolution of issues and thus ensuring adequate nutritional intake. For example, following a recommendation to increase the NG feed by the dietitian, but not carried out by the nursing staff, the GRA was able to quickly highlight the issue to the ward-based dietitian to expedite a resolution. Another interesting issue was that the NG feed would be stopped to allow a physiotherapy mobility session to be undertaken, but would not then be re-started. Liaison between the ward dietitian and physiotherapist by the GRA facilitated co-ordination of both aspects of care. The role also involved supervising swallowing practice and the GRA liaised with the ward dietitian for an appropriate nutritional supplement with increased calorie value to be used.

Table 2 illustrates the number of visits made by the GRA to carry out the physiotherapy and dietetic tasks each week during the patient's ward-based stay. This indicates that the GRA was making on average between one to two physiotherapy and one to two nutritional visits per day to the patient to facilitate the tasks.

Insert Table 2

While this pilot feasibility study focused predominantly on physical and nutritional rehabilitation the GRA was available to work with other allied health professions (AHP's) if required. This patient required input from the speech and language therapist due to the swallowing issues. Following assessment,

the speech and language therapist (SLT) identified swallowing exercises that the patient could practice with assistance and that the GRA was able to undertake with the patient.

Table 3 summarises the change in weekly outcome measures during the patient's ward-based stay. Week 0 illustrates the scores immediately after discharge from intensive care with subsequent weeks demonstrating the change in scores until discharge home. The Rivermead Mobility Index demonstrates a steady improvement during the ward stay with the patient able to independently mobilise, climb stairs and pick up an object from the floor by discharge. In week 3 when the patient was able to independently transfer and mobilise the timed tests were included. These timed tests show slow times in week 3 that improve gradually over the weeks, although by week 7 were still not within the normal expected range (Steffen *et al.*, 2002). This patient had suffered a previous stroke so their times may not return to normal values, although this return to normal values would be expected in patients with no pre-existing health conditions affecting mobility. The visual analogue scales highlighted issues of concern to the patient. She reported low levels of breathlessness throughout the ward-based stay. Interestingly, her reports of pain and stiffness were also low but both rose simultaneously for one week in week 4 before reducing again. Her perception of joint stiffness increased again in week 7. Her rating of confidence walking, when she was able to mobilise independently, was initially quite high but subsequently reduced. Her reports of fatigue varied during the weeks but were at the highest in week 7 just before discharge home. Her grip strength increased steadily over the 7

week period although at the time of discharge values were still less than 85% of normal, which is an indicator of protein malnutrition (Klidjian, 1982). Calorie and protein intake matched estimated nutritional requirements on discharge from ICU but decreased during week 1 due to problems with NG dislodgement. In week 4 a percutaneous endoscopic gastrostomy (PEG) tube was inserted in preparation for longer term enteral feeding. Subsequently, calorie and protein intake was almost doubled to facilitate weight gain. The number of trips off the ward increased considerably during the seven weeks reflecting increased physical ability. The outcome measures overall demonstrate a gradual improvement of physical and nutritional status for this patient.

Insert Table 3

Interestingly, during her 52 day ward stay the patient was seen by 61 different healthcare professionals. This included 33 medical staff, 10 nursing staff, 10 physiotherapists, 5 dietitians, 2 speech and language therapists and 1 occupational therapist. The GRA provided the most consistent contact with the patient during her ward stay, developing a rapport that resulted in many issues and concerns of the patient and her husband being raised. The GRA was able to pass this information to the appropriate health professionals, with consent, to ensure these concerns were dealt with.

Some negative issues, as a result of, providing additional rehabilitation with a GRA did arise surrounding the management of this patient. The patient

became easily fatigued during treatment sessions and demonstrated poor exercise tolerance during the phase immediately after discharge from intensive care. However, the GRA was able to be flexible to this issue and delivered short but more frequent treatment sessions. This type of flexibility was not possible from other healthcare professions and is a benefit of such a service. However, the negative side to this was the large amount of time the GRA spent travelling between wards or back and forth to individual patients.

A challenging aspect of the post was that the GRA had to communicate with multiple staff from many different professions. This was then repeated for each different ward that patients, being managed by the GRA, were sent. The GRA was required to maintain high levels of communication at all times.

This feasibility study highlighted the training needs of such a GRA post. As this generic role was specific to those after critical illness the GRA required an awareness of the complex problems that can result from the critical illness. The generic nature of the role resulted in the GRA working alongside different professional groups e.g. physiotherapy and dietetics. Recognition of profession specific requirements led to the development of profession specific training that will become part of a single training package. This is still under development for use in future research.

In summary, through this case description we have been able to describe the role of a GRA to provide rehabilitation after critical illness. Examples of the type of tasks undertaken by the GRA have been provided. The number of

visits the GRA was able to provide in this case description are included. The weekly outcomes of the patient indicate that the patient improved during their ward-based stay. An important issue raised was the continuity of care the GRA was able to offer and the flexibility of frequent but short treatment sessions. The GRA required very good communication skills and the need for comprehensive training for the GRA was highlighted.

Discussion

Overall, the GRA was able to provide increased amounts of rehabilitation to this patient who had a number of rehabilitation issues following discharge from intensive care. The GRA was successfully able to provide this rehabilitation in conjunction with the ward-based staff, who designed a programme of rehabilitation tailored to the individual patient that the GRA was able to deliver. This case description demonstrates that a GRA was able to work with established ward-based staff and that this model of service delivery was feasible.

An important aspect of this model of service delivery was the ability of the GRA to offer continuity of care. The wide range of problems that a patient may present with after critical illness is well-documented (Griffiths and Jones, 1999; Herridge *et al.*, 2003; Cuthbertson *et al.*, 2004), and their management can require many different healthcare professionals, as illustrated in our case study. The large number of staff is a reflection of the current fragmented approach to care after critical illness. The NICE guideline 'Rehabilitation after critical illness' (2009) highlights the importance of continuity of care after

critical illness. The GRA facilitated rehabilitation across different professions delivered by only one person, improving communication and continuity, and was able to facilitate other elements of rehabilitation such as trips off the ward and visits back to the intensive care unit. Prior to the piloting of this role arranging such visits was difficult as ward-based staff were often busy and unable to arrange for them to happen.

This case description highlighted the flexibility of a GRA post. At this stage of rehabilitation, immediately after discharge from intensive care, the patient was fatigued and unable to tolerate long treatment sessions, a common problem following critical illness. The GRA was able to accommodate short but frequent treatment sessions and allow the patient some control over when they received their rehabilitation sessions. Felder-Alford (2006) highlighted the feelings of loss of control that can occur while being ill in hospital and describes how negotiating with healthcare professionals about the delivery of care can help with regaining control.

One issue of interest specific to the physiotherapy tasks was the provision of an exercise sheet to carry out independent exercises. Despite using a diary system to prompt the patient and allow recording, the patient demonstrated poor compliance with these self-directed exercises and admitted to finding it difficult to motivate herself despite being enthusiastic about rehabilitation sessions with the GRA. This patient required the external motivation of the GRA at this ward-based stage. Delivery of rehabilitation during this ward-based phase may be affected by confounding issues such physical ability

(Van der Schaaf *et al.*, 2008) and in this case motivation. Further work is needed to explore patient sub-groups that respond and benefit most from the different approaches to ward-based rehabilitation.

From a nutritional point of view the patient responded well to goal-setting, a practice which is not routinely carried out by dietitians. The GRA was able to discuss with the patient on a daily basis as to how she would achieve her nutritional targets. In this case description the patient's main source of nutrition was via a PEG tube, which is not routine practice for most patients after critical illness. The practice of goal-setting to facilitate nutritional intake was successful in other patients receiving an oral diet only.

There were some negative aspects associated with this method of service delivery. The GRA spent a considerable amount of time travelling between different patients each day and although the ability to be flexible was a positive aspect the frequent short visits resulted in increased times travelling from ward to ward. This issue was compounded by patients being located in different wards within the hospital. Future research should undertake an economic evaluation of this service delivery model.

The different locations of the patients across various wards meant that the GRA had to communicate with different ward-based multi-disciplinary teams for each patient in their care. Initially this required a lot of effort in an attempt to become part of each ward team but as this feasibility study progressed it appeared that ward-based staff became more aware of the GRA and

anecdotally the GRA reported their role became easier. However, as a GRA, this is a challenging aspect of such a post and it could be suggested that future posts should be undertaken by assistants with some previous experience of working in healthcare. Further research is required to evaluate both how other health professional perceive such a post and how the GRA perceive their role in relation to other health care professionals.

The feasibility study and this case description highlighted the need for a comprehensive training programme for a GRA working with this patient population. Through individual case descriptions common issues were identified that were required to be included in a standard training programme e.g. supervision of exercises with appropriate risk management and understanding of NG feeding. A comprehensive training programme is currently being developed. There is currently no regulation for such assistant posts in the NHS anywhere in the UK (Birch and Martin, 2009) although work is underway to develop this. This should be considered when developing a training programme to ensure the training is adequate for the post as no further regulation is currently in place.

Only limited conclusions can be drawn as this is only a single case description and a larger study evaluating the impact of this role on recovery after critical illness is required. An evaluation of the provision of adequate training also needs to be undertaken.

Conclusions

This case description indicates that a service delivery model, using a GRA in conjunction with ward-based staff, is feasible to enhance rehabilitation delivered to patients after critical illness. The study demonstrates that ICU related problems can be managed at this early stage, after discharge from intensive care, using a GRA in conjunction with ward-based staff. Further research is required to establish whether this model of service delivery has an impact on ICU related problems, the prevention of chronic problems developing, impact on the patients health related quality of life and whether it is cost effective.

WHAT IS KNOWN ABOUT THIS TOPIC: Following critical illness patients can present with a number of different physical and psychological problems including muscle wasting and weakness, fatigue, reduced appetite, post-traumatic stress, anxiety and depression. At present, little research has been undertaken to evaluate possible rehabilitation strategies to address these problems after critical illness.

WHAT THIS PAPER ADDS: This paper explores one possible service delivery model for providing rehabilitation after critical illness. The case description illustrates the feasibility of a generic rehabilitation assistant to provide ward-based rehabilitation in conjunction with ward-based staff. Further research evaluating this service delivery model is required.

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Table 1 Physiotherapy and nutritional tasks allocated to Generic Rehabilitation Assistant

<i>Physiotherapy Tasks</i>	<i>Nutritional Tasks</i>
<ul style="list-style-type: none"> • Supervising exercise programme • Assisting physiotherapist when 2 people required for mobility practice • Provision of exercise sheet • Mobility practice • Stair practice • Exercise sessions in the physiotherapy gym • Pacing • Trips off the ward 	<ul style="list-style-type: none"> • Monitor delivery of NG feed • Completion of daily record charts to monitor nutritional intake • Ensure delivery and consumption of supplement drinks • Ensure delivery and consumption of additional snacks • Provide assistance at mealtimes (as required)

Table 2 Number of visits (week by week) made by the Generic Rehabilitation Assistant

	<i>Week 1</i>	<i>Week 2</i>	<i>Week 3</i>	<i>Week 4</i>	<i>Week 5</i>	<i>Week 6</i>	<i>Week 7</i>
Physiotherapy	7	8	7	8	9	10	10
Nutritional	9	8	6	7	8	5	10

Table 3 Week by week outcome measures

Outcome Measures	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Rivermead Mobility Index	0	1	3	6	7	7	8	11
Timed Up and Go (seconds)	N/A	N/A	N/A	55	44	22.8	18.8	17
10 metre walk test (seconds)	N/A	N/A	N/A	36	34	17.2	16.8	14.5
VAS Breathlessness	1.6	1.2	1.4	0.6	1.2	1.5	1.3	1.3
VAS Pain	0	0.2	0.8	0.8	3.0	1.3	1.0	1.0
VAS Joint Stiffness	2.3	1.0	1.0	0.9	3.7	1.9	0.9	4.1
VAS Confidence walking	N/A	N/A	N/A	8.0	8.8	7.3	4.3	6.4
VAS Fatigue	2.1	0.2	2.7	2.1	2.5	1.6	1.1	3.6
VAS Appetite	2.6	0.1	0.9	6.0	5.1	4.2	3.9	4.7
Handgrip Dynamometry (% of normal)	28	39	48	51	54	60	62	68
Average calorie intake as % of requirements	124.1	69.5	91.8	116.7	110.7	149.8	214.9	198.7
Average protein intake as % of requirements	98.4	65.9	69.4	86.0	86.3	127.7	258.0	223.1
Number of trips off the ward	0	0	0	1	2	2	10	6